

## REMARKS

Claims 1-12 are pending in the present Application. No claims have been canceled, claims 6, 7, 9, and 11 have been amended, no claims have been added, and Claims 1-5 and 12 are withdrawn, leaving Claims 6-11 for consideration upon entry of the present Amendment.

### Objections/Amendments to Specification

The Specification has been objected to on p. 6, line 24, for missing a space in the phrase “urea(NH<sub>2</sub>CONH<sub>2</sub>)”. The Specification has therefore been amended on p. 6, line 24, to insert a space to provide the phrase “urea<sub>a</sub>(NH<sub>2</sub>CONH<sub>2</sub>)”.

### Objections/Amendments to Claims

Claims 7, 9, and 11 have been objected to for missing units for the particle size of 150 in Claim 7; and for not clearly showing the sublimable material of Formula 1 by the current placement of a colon.

Claim 7 has therefore been amended to provide units of micrometers (μm) for the particle size, and to correct the placement of the colon by moving the description of steps b.)-d.) to a position after the description of Formula 1, thereby clarifying the listed catalyst active material. Support for the amendments can be found in the Specification as filed at least on p. 7, line 15.

Claim 6 has been amended to correct an inadvertent typographical error.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

### Claim Rejections Under 35 U.S.C. § 102(e)

Claims 6, 8, and 10 stand rejected under 35 U.S.C. § 102(e), as allegedly anticipated by U.S. Patent Application Publication No. 2007/0093382 (“Vanderspurt”). Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

The method claimed in Claim 6 for preparing a catalyst containing a composite metal oxide as a catalytic active component, includes the following steps:

- a) preparing a catalyst suspension containing salt of each metal components of the composite metal oxide for the catalytic active component;
- b) drying the catalyst suspension and then crushing the dried material to prepare a catalyst powder;
- c) mixing the catalyst powder with a catalyst additive selected from sublimable materials; and
- d) calcining the mixture from the step c).

Vanderspurt, however, states that the method of Vanderspurt avoids the need for “using surfactants and lengthy aging steps” and discloses:

“1) dissolving salts of the cerium and at least one other constituent in water to form a dilute metal salt solution,

“2) adding urea, either as a solid or aqueous solution,

“3) heating the solution of metal salt and urea to near boiling to coprecipitate homogeneously a mixed-oxide of the cerium and the one or more other constituent(s) as a gelatinous coprecipitate,

“4) optionally maturing, and if and when beneficial, the gelatinous coprecipitate [which corresponds to the catalyst suspension of the invention claimed in instant Claim 6] in accordance with a thermal schedule,

“5) replacing water in the solution with a water miscible, low surface-tension solvent such as dried 2-propanol,

“6) drying the coprecipitate and solvent to remove substantially all of the solvent, and

“7) calcining the dried coprecipitate at an effective temperature, typically moderate, for an interval sufficient to remove adsorbed species and strengthen the structure against premature aging.” Vanderspurt, [0023].

The addition order for adding the sublimable materials, and therefore the role of the sublimable materials in the claimed invention, are different from those of the addition of urea

in the sequence in Vanderspurt, and the role of the urea. Specifically, the sublimable material of Claim 6 is added *after* the preparation of the catalyst suspension. On the other hand, the urea of Vanderspurt (which corresponds to the sublimable material as Claim 6) is added *before* the preparation of the gelatinous coprecipitate (corresponding to the catalyst suspension of Claim 6), as described in Vanderspurt. Vanderspurt, p. 6, [0055]. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*” *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, “[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements “*arranged as in the claim.*” *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984) (Emphasis added). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985). Vanderspurt does not disclose the elements of Claim 6, “arranged as in the claim”, as noted above, and therefore for at least this reason, fails to anticipate the claim.

Nor does Vanderspurt provide a suggestion or incentive for rearranging the order of inclusion of the urea. Vanderspurt discloses that the urea is hydrolyzed by heating the solution of metal salt and urea, whereupon the reaction of the soluble metal ions with the urea hydrolysis product forms a cloudy suspension of nanocrystals. In contrast, the role for the sublimable material of Claim 6 is to control the surface area and the distribution fine pores of the catalyst, because the sublimable material takes a certain volume in the composition for catalyst preparation and then is removed by a drying or calcining process. See Specification, p. 6, lines 3-8. Vanderspurt, however, discloses use of urea and the order of its addition, for precipitation of the metal salt solution. Vanderspurt, p. 6, [0054]-[0055].

Moreover, the method of Claim 6 includes a calcining process that is designed to remove sublimable material (e.g., urea), thereby increasing the specific surface area of the catalyst. On the contrary, the calcining process of Vanderspurt is performed not to remove

the urea, but to remove adsorbed species and strengthen the structure against premature aging. Vanderspurt, p. 6, [0054]. Vanderspurt neither discloses nor suggests the limitation of mixing the catalyst powder with the sublimable materials and then controlling the specific surface area of the catalyst by removing the sublimable materials in the calcining process. Were it so alleged, Vanderspurt would also therefore fail to render the instant claims obvious.

Thus, all limitations of Claim 6 are not disclosed by Vanderspurt as in Claim 6, and therefore Vanderspurt fails to anticipate Claim 6 or its dependent Claims 8 and 10. Reconsideration and withdrawal of the rejection, and allowance of the claims, is respectfully requested.

#### Claim Rejections Under 35 U.S.C. § 103(a)

Claims 6, 7, 9, and 11 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 4,424,141 (“Grasselli”). Applicants respectfully traverse this rejection.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). “A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

As claimed in Claim 6, the sublimable materials are mixed to prepare a catalyst with high specific surface area. In order to prepare a catalyst with high specific surface area, the sublimable materials are mixed with a catalyst powder, and then the sublimable materials are removed according to Claim 6. The claimed sublimable materials include urea, melamine, ammonium oxalate, methyl oxalate, and naphthalene.

Grasselli discloses an organic liquid or a mixture of an organic liquid and water as the medium of liquid slurry, where the catalyst is prepared by calcining a precatalyst slurry. Grasselli, Col. 1, lines 48-60. Grasselli is silent as to the inclusion of sublimable materials. Further, Grasselli neither discloses nor suggests *mixing the catalyst powder with the sublimable materials*, then controlling the specific surface area of the catalyst by removing the sublimable materials in a calcining process. In addition, there is no suggestion or incentive found in Grasselli or the art that would suggest modifying Grasselli to mix the catalyst powder with a sublimable material, e.g., urea, to control the surface area of the catalyst by removing the sublimable material by calcining. Grasselli is silent as to control of either surface area. Therefore, Grasselli fails to disclose the inclusion of sublimable materials, and further fails to provide a suggestion or incentive that would lead one skilled in the art to modify Grasselli to include sublimable materials. Grasselli therefore cannot render Claim 6 obvious.

Furthermore, regarding Claim 7, it is stated in the Office Action dated January 12, 2009, on p. 4, last 3 lines, to p. 5, line 2, that while Grasselli does not disclose a calcining temperature of 400 to 500°C, that “it would have been obvious to perform calcining at a temperature and time sufficient enough to result in the wanted removal of unwanted material or phase transformation.” Applicants disagree. As noted above, the disclosure of Grasselli is directed to “first stage catalysts”. Grasselli discloses that there is “no clear understanding in the art of exactly what features for a catalyst make it function as a first stage, second stage, or different type of catalyst” Col. 3, lines 3-8. However, Grasselli then states that “[c]ertain observations...can be made”, in particular that second stage catalysts calcined above about 537°C “lose most if not all of their activity”, and that “first stage catalysts work best if calcined (final calcination) above [537°C]” (e.g., 610°C). Col. 3, lines 12-15; see also Col 5, line 62 to Col. 6, line 4. Based on these teachings of Grasselli, there would be no expectation found in Grasselli that would lead one skilled in the art to calcine the composition of Grasselli at a temperature of less than 537°C, as Grasselli clearly teaches the use of calcining temperatures significantly higher than that claimed in Claim 7.

For these reasons at least, Grasselli fails to teach all elements of the instant claims,

and fails to provide a suggestion or incentive that would lead one skilled in the art to modify Grasselli to provide all limitations of Claim 6, or its dependent Claim 7, and therefore Grasselli does not render Claim 6, or its dependents 7, 9, and 11, unpatentable. Reconsideration and allowance are respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Response or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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